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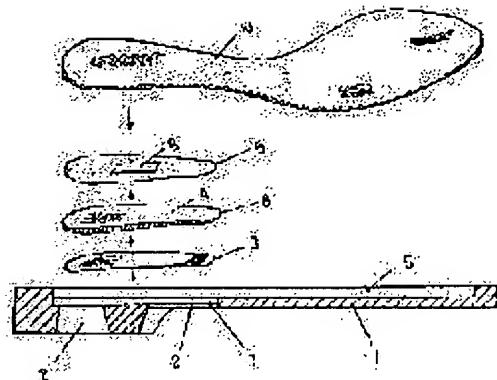
(21) Application number : 04-303334 (71) Applicant : ASICS CORP
 (22) Date of filing : 13. 11. 1992 (72) Inventor : HASHIMOTO SUSUMU

(54) AIR PERMEABLE SOLE OF SHOE

(57) Abstract:

PURPOSE: To provide a sole of shoe so formed that even in rain weather air can effectively permeate to the inside of a shoe instep, relating to improvements in the air permeable sole of shoe made from a synthetic resin.

CONSTITUTION: A sole main body 1, made from a synthetic resin or rubber or a mixture of them and having a recess 6 formed on the upper side thereof to fit with a foot mold with one or plural through holes 2 provided in the center of the heel and/or arch portion thereof is provided and a net sheet 3 made from a metal or synthetic resin for covering the through holes 2 is placed inside the lower stepped portion 7 of the recess 6 and a spacing layer 8 is formed on the outer surface of the net sheet 3 using an elastic mesh 4 or a partition plate 12 made from a synthetic resin. A blocking sheet 5 having an opening 9 bored therethrough is provided on the outer surface of the spacing layer 8, and a solid mesh plate 1 made from a synthetic resin for embedding into the recess 6 is provided on the upper surface of the sheet 5.



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CLAIMS

[Claim(s)]

[Claim 1] The sole body 1 formed with the synthetic resin which formed the depression 6 in alignment with last, and formed one piece or two or more through tubes 2 in the top-face side in the center section of the heel and/or non-****, synthetic rubber, or such mixture, Wrap metal or the network sheet 3 made of synthetic resin is laid for said through tube 2 in the lower order stepped part 7 of said depression 6. The opening layer 8 is formed in the top face of this network sheet 3 with the dashboard 12 of the elastic mesh material 4 or a synthetic-resin plate. The aeration sole characterized by coming to have the solid mesh plate 10 made from a synthetic fiber laid underground in the depression 6 which forms the electric shielding sheet 5 which drilled opening 9 in the top face of this opening layer 8, and meets the top face at said last.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention is a thing concerning amelioration of the sole which has permeability. In more detail The sole body made of synthetic resin mainly concerns, and air is adopted effectively in a shoes upper from a heel or non-***. It is going to offer the sole which has the structure where the aeration in a shoes upper can be used effectively, without making the adopted air flow to a tiptoe and allowing permeation of the water into a shoes upper especially also in case of rainy weather.

[0002]

[Description of the Prior Art] Conventionally, the sole which has aeration structure exists plentifully. As structure which considered the aeration into a shoes upper, although the direct through tube was prepared for example, in the sole body, what gave aeration structure is common to others, an insole, and an insole. the voice of the consumer who demands a feeling of lightweight nature and software, and waterproofness in gentleman shoes especially -- rising -- the sole made of the synthetic resin from the conventional *** -- the mainstream -- shifting -- resulting -- new -- the problem of permeability -- *** -- it hears -- it is rising to surface. Although the sole of especially the product made of synthetic resin was excellent a feeling of lightweight nature and software, and in respect of waterproofness with the material property, it had also become the big technical problem of the sole made of synthetic resin how MURE which permeability and moisture permeability are lacked and is produced in a shoes upper is canceled.

[0003] As this cure against MURE, conventionally, in elegance, the through tube which is open for free passage in a shoes upper from the ground-plane side of a sole is prepared, or means, such as preparing the through tube which is open for free passage in a shoes upper from the side face of a sole, are adopted. However, no well-known techniques of having these aeration structure were what has the defect with it and can be satisfied. For example, if it was in some which prepared the direct through tube from the ground-plane side of a sole body, it prepared for the moisture and foreign matter which permeate from this through tube, and when enlarged conversely, there was a defect in which it was hard to prevent permeation of moisture or a foreign matter that it will be hard to flow air sufficient in a shoes upper if a through tube is made small. Furthermore, the "shoes" shown in JP,56-120801,U is one of those prepared the through tube which is open for free passage in a shoes upper from the side face of a sole. Although this well-known example is the configuration of being covered with the air feeding layer of the structure by which air is fed and tends to carry out the forcible ventilation of the air adopted from the side face of a sole into a shoes upper by the air feeding layer when the cavity prepared and shines inside [whole] the sole and it is trampled in this cavity In practice, it was the configuration which a shoes wearer's sole and air feeding layer stick structurally, and bars circulation of air, and the aeration to the sole which there is no place where air escapes, cannot carry out the forcible ventilation of the air from a sole side face easily, and senses MURE most was difficult to get, and it was that from which effective effectiveness as a matter of fact is not acquired.

[0004]

[Problem(s) to be Solved by the Invention] The feelings of MURE at the time of shoes wear are the causes with the main temperature rise by the humidity rise by sweating from the sole, the temperature which collected in the shoes upper, and friction at the time of a walk. Moreover, the location which senses MURE most is the tiptoe section circumference, and it makes offering the sole which can adopt air most effectively [there are few inflows of the open air, therefore] from the heel or non-**** of the sole as for this design, and can send this in on the outskirts of the tiptoe section of the sole efficiently on the structure of shoes here with a technical technical problem.

[0005]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, this invention person came to offer invention which has the following configurations, as a result of inquiring wholeheartedly. Namely, the sole body which this invention formed the depression in alignment with last in the top-face side, and was formed with the heel and/or the synthetic resin which did not step on but prepared one piece or two or more through tubes in the center section, synthetic rubber, or such mixture, Wrap metallicity or the network sheet made of synthetic resin is laid for said tube in the lower order stepped part of said depression. An opening layer is formed in the top face of this network sheet with the dashboard of the elasticity which becomes with elastic mesh material or a synthetic-resin plate. It adopted coming to have the solid mesh plate made from a synthetic fiber laid underground in the depression which prepares the electric shielding sheet which intercepts the water which drilled opening in the top face of this opening layer, and meets the top face at said last as a new technical means.

[0006]

[Function] According to this invention, it does not ***** and/or step on, but in the prepared through tube, wrap metal or the network sheet made of synthetic resin is constituted so that permeation of the heel and/or the earth and sand which do not step on but permeate from the section, and a foreign matter may be prevented. Therefore, an opening layer expands and contracts in response to running of a shoes wearer or the landing pressure at the time of a walk, and the through tube itself is drilled greatly, and since it has the opening layer of the elasticity which adopted and formed a lot of air in the upper layer of this network sheet with elastic mesh material or a synthetic-resin plate, the air by which it was placed between opening layers circulates compulsorily upwards through opening of a shield. Moreover, similarly the air which passed the shield flows in a shoes upper compulsorily in response to a landing pressure with the solid mesh plate of further the product made from the synthetic fiber of the upper part. That is, this invention can use an air distribution function effectively by having installed the network sheet which prevents foreign matter mixing from the ground in the nearest location, and having made it the multilayer structure further formed in the upper part at the upper part section in an opening layer, rain and the shield which prevents permeation of water, and the solid mesh that promotes circulation further.

[0007]

[Example] The example of this invention is explained according to a drawing below. the depression 6 which drawing 1 is the top view showing the sole body of this design, and meets the top-face side at the periphery of the sole body 1, and the last of abbreviation isomorphism -- puncturing -- **** -- a heel center-section list -- not stepping on -- the center of the section -- a crosspiece -- the through tube 2 which separates the section 9 and is penetrated from the touch-down section is formed. Under the present circumstances, about 2cm and breadth are the same and the shape of horseshoe shape doubled with the appearance of the heel, nothing, and the diameter medianus form the flat-surface configuration of the through tube 2 of the starting heel in about 2cm.

[0008] From this, the width of face of the diameter medianus is formed for a long time a little, and the through tube 2 prepared in another side ***** is drilled by the magnitude of about 4cm here. Moreover, the through tube 2 of a heel is formed so that introduction of the shape of skirt breadth, and nothing and air may act effectively toward a ground plane, as shown in the sectional view of drawing 2. In addition, as a through tube 2 is shown in drawing 1 and drawing 2, although it does not step on but being prepared in the center of the section, of course, the center of a heel and the thing to prepare only in

other heels are also contained in this design.

[0009] Next, by showing the wrap network sheet 3, this network sheet 3 is dented, and this is settled [lay / said through tube 2 / drawing 3 / in the lower order stepped part 7 of the depression 6 of a sole body] in six, and the through tube 2 is completely formed in wrap magnitude. Moreover, since the network sheet 3 is dented and it fixes in six, the periphery part is pasted up on the opening edge

periphery of a through tube 2 with adhesives etc. Under the present circumstances, as for being used as a network sheet 3, a waterproof good material is used for metal fiber or the fiber made of synthetic resin.

[0010] Next, drawing 4 shows the opening layer 8 formed by the elastic mesh material 4 which bundled the good plastic fiber of stability to three-dimensional [spral]. This opening layer 8 accumulates the air from a through tube 2 here, and demonstrates the work which makes the air of the opening layer 8 flow out compulsorily in a shoes upper according to a flexible operation of the mesh material 4 by a shoes wearer's landing pressure. Drawing 5 forms an air mediation layer in the gap of each diaphragm 12 while it makes the dashboard 12 of synthetic-resin nature stand close together and urging elasticity and restoration to it as other means to form the opening layer 8.

[0011] Next, the top face of said opening layer 8 is equipped with drawing 6, and the electric shielding sheet 5 which intercepts permeation of the water from the lower part is shown. The thin web material to which this cutoff sheet 5 makes a waterproof good nylon plate the start is used. Moreover, the opening 9 which circulates air is formed in this cutoff sheet 5. As shown in drawing 10, as for the location of the starting opening 9, it is desirable to prepare near right above [of the crosspiece 11 of the heel of the sole body 1 and the intermediate phase this section of the through tube 2 which was not stepped on but was formed in the section, i.e., a sole body,]. If it prepares in this location, the moisture which permeates from a through tube 2 is interrupted in parts other than the opening 9 section of the electric shielding sheet 5, can pass opening 8 and can make only air flow out up.

[0012] Next, drawing 7 is wearing formation ***** so that it may lay underground in the depression 6 which shows the solid mesh plate 10 of synthetic-fiber nature with which it is equipped on said electric shielding sheet 5, and was formed in the top face of the sole body 1. The solid mesh plate 10 of this synthetic-fiber nature is formed in what has stability with a landing pressure and can form the mediation layer of air, and the mesh material of elasticity which bundled plastic fiber to three-dimensional [spral] is suitable. Therefore, you may be the same material as the elastic mesh material 4 which has the opening layer 8 as shown in drawing 4 as a solid mesh plate 10 to apply.

[0013] Drawing 8 shows the sectional view of the sole of this design formed of each [these] configuration member, and drawing 9 shows the condition that the laminating of the network sheet 3, the opening layer 8, the electric shielding sheet 5, and the solid mesh plate 11 is carried out one by one inside into the depression 6 of the sole body 1. Therefore, the air which flowed from the through tube 2 of a sole body according to this invention passes compression with the landing pressure of the shoes wearer through whom it passes to the opening layer 7, passes the opening 8 of the electric shielding sheet 5 according to a restoration operation, results in the solid mesh plate 10 further, and flows to a shoes wearer's whole sole through the solid mesh plate 10.

[0014]

[Effect of the Invention] Therefore, according to invention, by the heel and/or the through tube which was not stepped on but was prepared in the section, since permeation of the earth and sand which permeate from a heel and/or non-**** especially and the foreign matter which can adopt a lot of direct air in a shoes upper is constituted so that a network sheet may protect efficiently, it can enlarge magnitude of the through tube itself as much as possible, and it can use the aeration effectiveness effectively. Moreover, since it has the opening layer of the elasticity formed in the upper layer of this network sheet with elastic mesh material or a synthetic-resin plate, the air by which it was placed between opening layers with running of a shoes wearer or the landing pressure at the time of a walk can be circulated compulsorily up. Moreover, the shield formed in the upper part of an opening layer can intercept the water from the bottom, and can circulate only air from opening to the upper part. Moreover, similarly the solid mesh plate made from a synthetic fiber formed in the upper part of a shield can be expanded and contracted in response to a landing pressure, and the air sent from the lower part can be

made to flow out and flow in a shoes upper compulsorily. Therefore, the sole which was always rich in the amenity can be offered, without according to this invention, circulation of the air in a shoes upper always being performed by natural walk actuation, and allowing permeation of water in a shoes upper in case of rainy weather.

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TECHNICAL FIELD

[Industrial Application] This invention is a thing concerning amelioration of the sole which has permeability. In more detail The sole body made of synthetic resin mainly concerns, and air is adopted effectively in a shoes upper from a heel or non-****. It is going to offer the sole which has the structure where the aeration in a shoes upper can be used effectively, without making the adopted air flow to a tiptoe and allowing permeation of the water into a shoes upper especially also in case of rainy weather.

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PRIOR ART

[Description of the Prior Art] Conventionally, the sole which has aeration structure exists plentifully. As structure which considered the aeration into a shoes upper, although the direct through tube was prepared for example, in the sole body, what gave aeration structure is common to others, an insole, and an insole. the voice of the consumer who demands a feeling of lightweight nature and software, and waterproofness in gentleman shoes especially -- rising -- the sole made of the synthetic resin from the conventional **** -- the mainstream -- shifting -- resulting -- new -- the problem of permeability -- *** -- it hears -- it is rising to surface. Although the sole of especially the product made of synthetic resin was excellent a feeling of lightweight nature and software, and in respect of waterproofness with the material property, it had also become the big technical problem of the sole made of synthetic resin how MURE which permeability and moisture permeability are lacked and is produced in a shoes upper is canceled.

[0003] As this cure against MURE, conventionally, in elegance, the through tube which is open for free passage in a shoes upper from the ground-plane side of a sole is prepared, or means, such as preparing the through tube which is open for free passage in a shoes upper from the side face of a sole, are adopted. However, no well-known techniques of having these aeration structure were what has the defect with it and can be satisfied. For example, if it was in some which prepared the direct through tube from the ground-plane side of a sole body, it prepared for the moisture and foreign matter which permeate from this through tube, and when enlarged conversely, there was a defect in which it was hard to prevent permeation of moisture or a foreign matter that it will be hard to flow air sufficient in a shoes upper if a through tube is made small. Furthermore, the "shoes" shown in JP,56-120801,U is one of those prepared the through tube which is open for free passage in a shoes upper from the side face of a sole. Although this well-known example is the configuration of being covered with the air feeding layer of the structure by which air is fed and tends to carry out the forcible ventilation of the air adopted from the side face of a sole into a shoes upper by the air feeding layer when the cavity prepared and shines inside [whole] the sole and it is trampled in this cavity In practice, it was the configuration which a shoes wearer's sole and air feeding layer stick structurally, and bars circulation of air, and the aeration to the sole which there is no place where air escapes, cannot carry out the forcible ventilation of the air from a sole side face easily, and senses MURE most was difficult to get, and it was that from which effective effectiveness as a matter of fact is not acquired.

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EFFECT OF THE INVENTION

[Effect of the Invention] Therefore, according to invention, by the heel and/or the through tube which was not stepped on but was prepared in the section, since permeation of the earth and sand which permeate from a heel and/or non-**** especially and the foreign matter which can adopt a lot of direct air in a shoes upper is constituted so that a network sheet may protect efficiently, it can enlarge magnitude of the through tube itself as much as possible, and it can use the aeration effectiveness effectively. Moreover, since it has the opening layer of the elasticity formed in the upper layer of this network sheet with elastic mesh material or a synthetic-resin plate, the air by which it was placed between opening layers with running of a shoes wearer or the landing pressure at the time of a walk can be circulated compulsorily up. Moreover, the shield formed in the upper part of an opening layer can intercept the water from the bottom, and can circulate only air from opening to the upper part. Moreover, similarly the solid mesh plate made from a synthetic fiber formed in the upper part of a shield can be expanded and contracted in response to a landing pressure, and the air sent from the lower part can be made to flow out and flow in a shoes upper compulsorily. Therefore, the sole which was always rich in the amenity can be offered, without according to this invention, circulation of the air in a shoes upper always being performed by natural walk actuation, and allowing permeation of water in a shoes upper in case of rainy weather.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] The feelings of MURE at the time of shoes wear are the causes with the main temperature rise by the humidity rise by sweating from the sole, the temperature which collected in the shoes upper, and friction at the time of a walk. Moreover, the location which senses MURE most is the tiptoe section circumference, and it makes offering the sole which can adopt air most effectively [there are few inflows of the open air, therefore] from the heel or non-**** of the sole as for this design, and can send this in on the outskirts of the tiptoe section of the sole efficiently on the structure of shoes here with a technical technical problem.

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MEANS

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, this invention person came to offer invention which has the following configurations, as a result of inquiring wholeheartedly. Namely, the sole body which this invention formed the depression in alignment with last in the top-face side, and was formed with the heel and/or the synthetic resin which did not step on but prepared one piece or two or more through tubes in the center section, synthetic rubber, or such mixture, Wrap metallicity or the network sheet made of synthetic resin is laid for said through tube in the lower order stepped part of said depression. An opening layer is formed in the top face of this network sheet with the dashboard of the elasticity which becomes with elastic mesh material or a synthetic-resin plate. It adopted coming to have the solid mesh plate made from a synthetic fiber laid underground in the depression which prepares the electric shielding sheet which intercepts the water which drilled opening in the top face of this opening layer, and meets the top face at said last as a new technical means.

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OPERATION

[Function] According to this invention, it does not ***** and/or step on, but in the prepared through tube, wrap metal or the network sheet made of synthetic resin is constituted so that permeation of the heel and/or the earth and sand which do not step on but permeate from the section, and a foreign matter may be prevented. Therefore, an opening layer expands and contracts in response to running of a shoes wearer or the landing pressure at the time of a walk, and the through tube itself is drilled greatly, and since it has the opening layer of the elasticity which adopted and formed a lot of air in the upper layer of this network sheet with elastic mesh material or a synthetic-resin plate, the air by which it was placed between opening layers circulates compulsorily upwards through opening of a shield. Moreover, similarly the air which passed the shield flows in a shoes upper compulsorily in response to a landing pressure with the solid mesh plate of further the product made from the synthetic fiber of the upper part. That is, this invention can use an air distribution function effectively by having installed the network sheet which prevents foreign matter mixing from the ground in the nearest location, and having made it the multilayer structure further formed in the upper part at the upper part section in an opening layer, rain and the shield which prevents permeation of water, and the solid mesh that promotes circulation further.

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EXAMPLE

[Example] The example of this invention is explained according to a drawing below. the depression 6 which drawing 1 is the top view showing the sole body of this design, and meets the top-face side at the periphery of the sole body 1, and the last of abbreviation isomorphism -- puncturing -- **** -- a heel center-section list -- not stepping on -- the center of the section -- a crosspiece -- the through tube 2 which separates the section 9 and is penetrated from the touch-down section is formed. Under the present circumstances, about 2cm and breadth are the same and the shape of horseshoe shape doubled with the appearance of the heel, nothing, and the diameter medianus form the flat-surface configuration of the through tube 2 of the starting heel in about 2cm.

[0008] From this, the width of face of the diameter medianus is formed for a long time a little, and the through tube 2 prepared in another side ***** is drilled by the magnitude of about 4cm here. Moreover, the through tube 2 of a heel is formed so that introduction of the shape of skirt breadth, and nothing and air may act effectively toward a ground plane, as shown in the sectional view of drawing 2. In addition, as a through tube 2 is shown in drawing 1 and drawing 2 , although it does not step on but being prepared in the center of the section, of course, the center of a heel and the thing to prepare only in other heels are also contained in this design.

[0009] Next, by showing the wrap network sheet 3, this network sheet 3 is dented, and this is settled [lay / said through tube 2 / drawing 3 / in the lower order stepped part 7 of the depression 6 of a sole body] in six, and the through tube 2 is completely formed in wrap magnitude. Moreover, since the network sheet 3 is dented and it fixes in six, the periphery part is pasted up on the opening edge periphery of a through tube 2 with adhesives etc. Under the present circumstances, as for being used as a network sheet 3, a waterproof good material is used for metal fiber or the fiber made of synthetic resin.

[0010] Next, drawing 4 shows the opening layer 8 formed by the elastic mesh material 4 which bundled the good plastic fiber of stability to three-dimensional [spral]. This opening layer 8 accumulates the air from a through tube 2 here, and demonstrates the work which makes the air of the opening layer 8 flow out compulsorily in a shoes upper according to a flexible operation of the mesh material 4 by a shoes wearer's landing pressure. drawing 5 forms an air mediation layer in the gap of each diaphragm 12 while it makes the dashboard 12 of synthetic-resin nature stand close together and urging elasticity and restoration to it as other means to form the opening layer 8.

[0011] Next, the top face of said opening layer 8 is equipped with drawing 6 , and the electric shielding sheet 5 which intercepts permeation of the water from the lower part is shown. The thin web material to which this cutoff sheet 5 makes a waterproof good nylon plate the start is used. Moreover, the opening 9 which circulates air is formed in this cutoff sheet 5. As shown in drawing 10, as for the location of the starting opening 9, it is desirable to prepare near right above [of the crosspiece 11 of the heel of the sole body 1 and the intermediate phase this section of the through tube 2 which was not stepped on but was formed in the section, i.e., a sole body,]. If it prepares in this location, the moisture which permeates from a through tube 2 is interrupted in parts other than the opening 9 section of the electric shielding sheet 5, can pass opening 8 and can make only air flow out up.

[0012] Next, drawing 7 is wearing formation ***** so that it may lay underground in the depression

6 which shows the solid mesh plate 10 of synthetic-fiber nature with which it is equipped on said electric shielding sheet 5, and was formed in the top face of the sole body 1. The solid mesh plate 10 of this synthetic-fiber nature is formed in what has stability with a landing pressure and can form the mediation layer of air, and the mesh material of elasticity which bundled plastic fiber to three-dimensional [spral] is suitable. Therefore, you may be the same material as the elastic mesh material 4 which has the opening layer 8 as shown in drawing 4 as a solid mesh plate 10 to apply.

[0013] Drawing 8 shows the sectional view of the sole of this design formed of each [these] configuration member, and drawing 9 shows the condition that the laminating of the network sheet 3, the opening layer 8, the electric shielding sheet 5, and the solid mesh plate 11 is carried out one by one inside into the depression 6 of the sole body 1. Therefore, the air which flowed from the through tube 2 of a sole body according to this invention passes compression with the landing pressure of the shoes wearer through whom it passes to the opening layer 7, passes the opening 8 of the electric shielding sheet 5 according to a restoration operation, results in the solid mesh plate 10 further, and flows to a shoes wearer's whole sole through the solid mesh plate 10.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the top view showing the top-face side of the sole body of this invention.
[Drawing 2] It is central drawing of longitudinal section of the sole body of this invention.
[Drawing 3] It is the top view showing a wrap network sheet for the through tube of a sole body.
[Drawing 4] It is the top view and partial enlarged-section schematic drawing showing the opening layer prepared in the crevice drilled in the top-face side of a sole body.
[Drawing 5] It is the partial enlarged-section schematic drawing showing the opening layer of a correction mold.
[Drawing 6] It is the top view showing a shield.
[Drawing 7] It is the top view and partial enlarged-section schematic drawing showing a solid mesh plate.
[Drawing 8] It is the cross-section schematic drawing of the shoes which have the sole of this invention.
[Drawing 9] It is drawing explaining the configuration member with which a sole body is equipped.

[Description of Notations]

- 1 Sole Body
- 2 Through Tube
- 3 Network Sheet
- 4 Elastic Mesh Material
- 5 Electric Shielding Sheet
- 6 Depression
- 7 Lower Order Stepped Part
- 8 Opening Layer
- 9 Opening
- 10 Solid Mesh Plate
- 11 Crosspiece
- 12 Dashboard

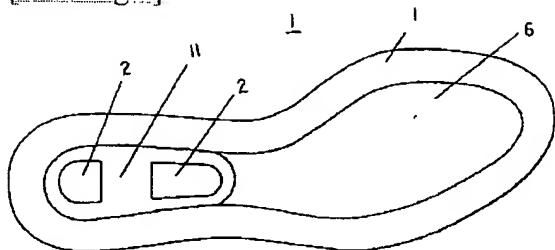
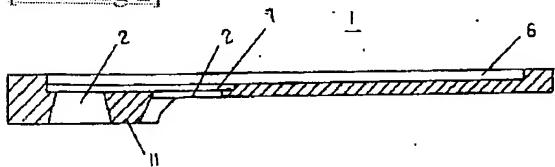
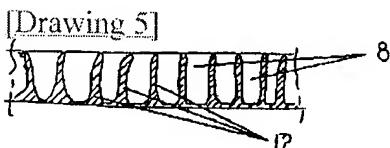
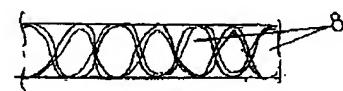
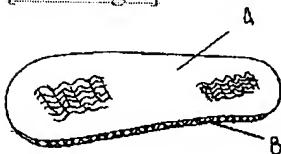
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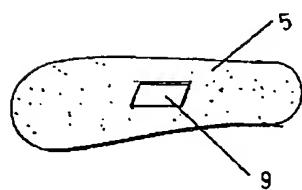
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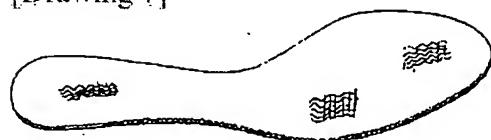
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DRAWINGS

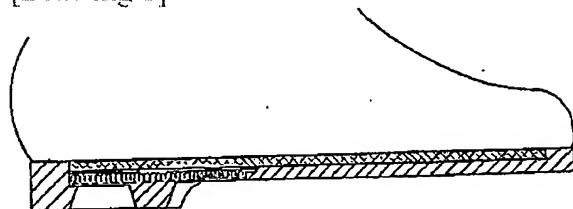
[Drawing 1]**[Drawing 2]****[Drawing 3]****[Drawing 4]****[Drawing 6]**



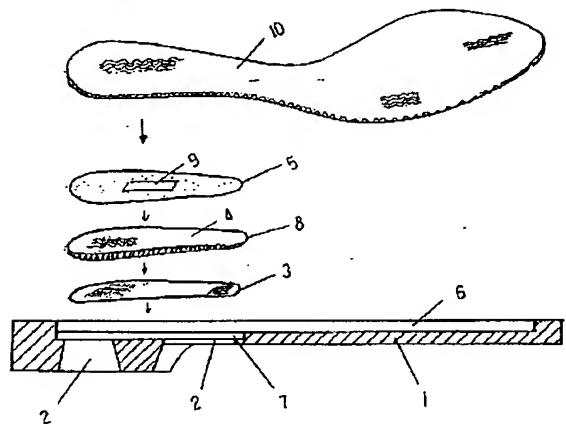
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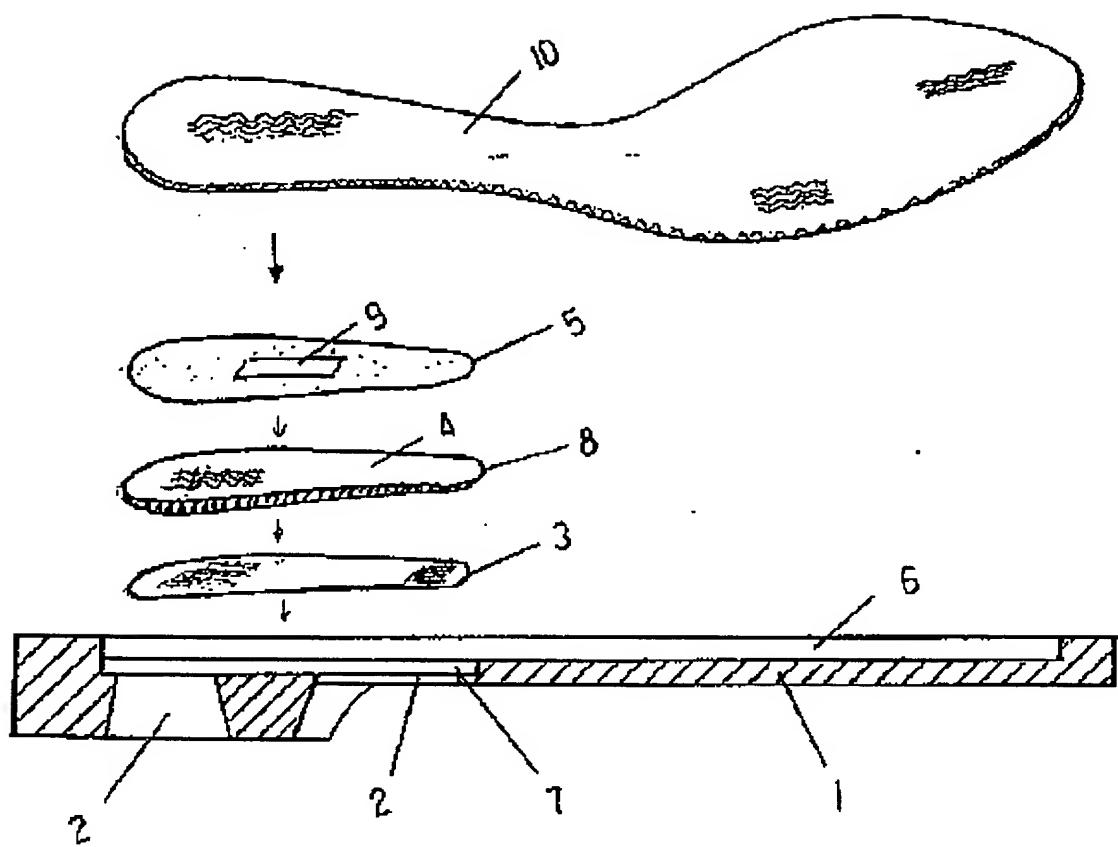
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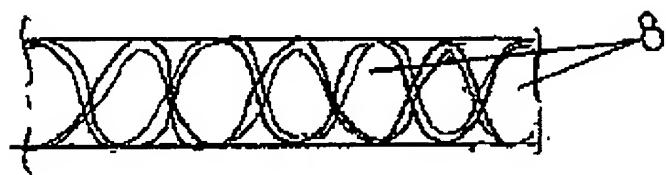
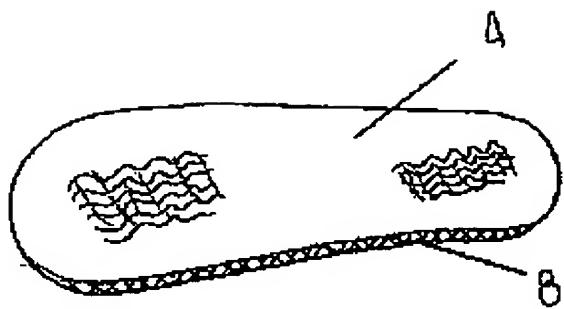


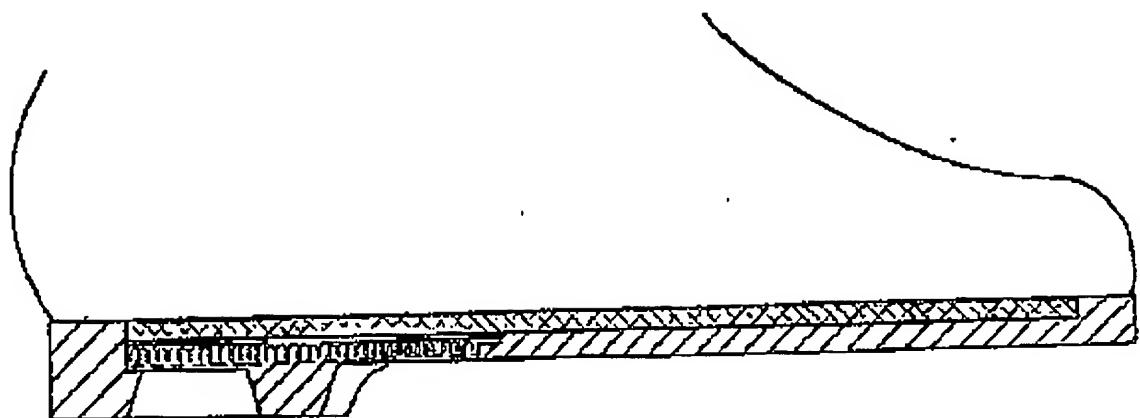
[Drawing 9]

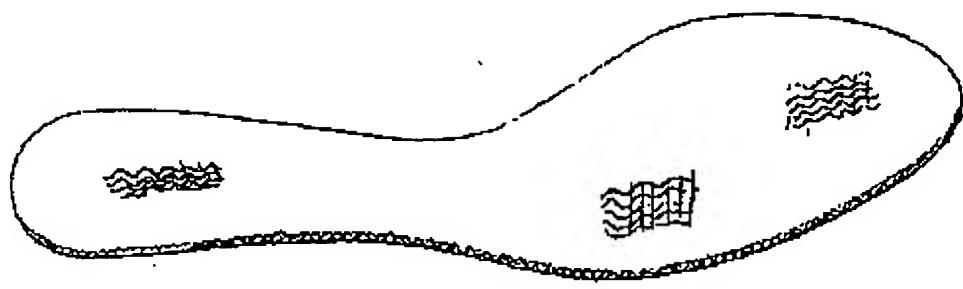


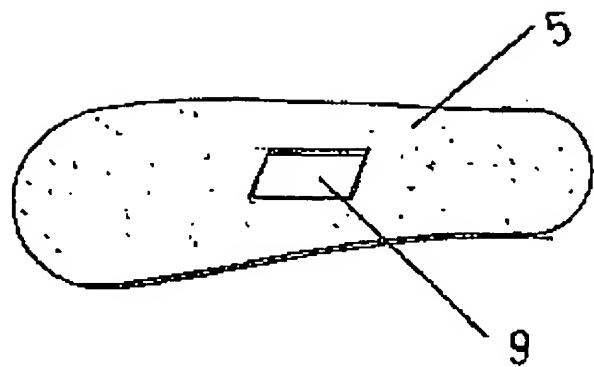
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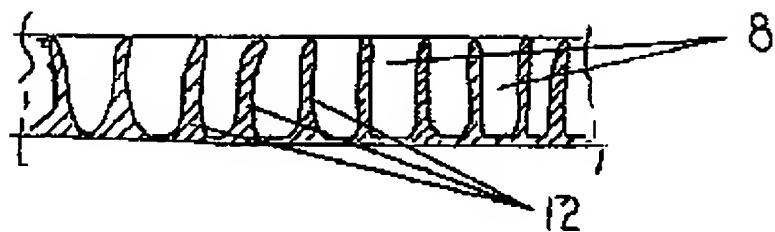










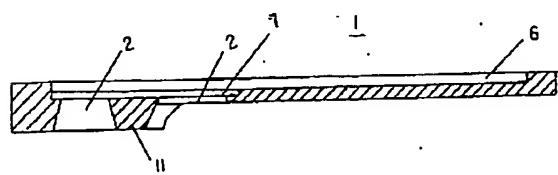


Drawing selection | drawing 3

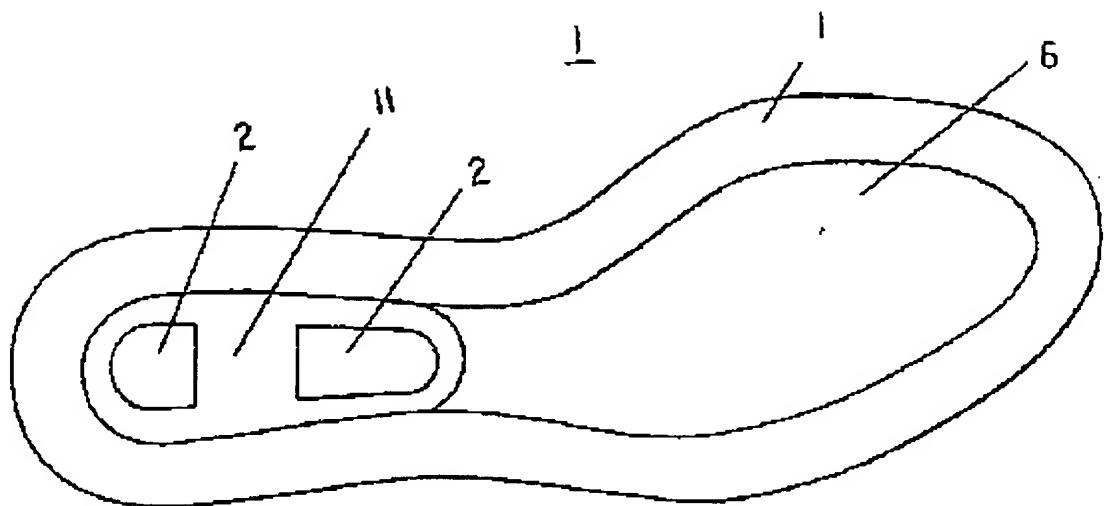


[Translation done.]

Drawing selection drawing 2



[Translation done.]



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